

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of Dufour et al.	:	
	:	ANTIROTATION TOOL HOLDER
Group Art Unit 3722	:	AND CUTTING INSERT
	:	
Serial No. 10/553,277	:	
	:	Confirmation No. 6625
Filed October 13, 2005	:	
	:	
Examiner Willmon Fridie, Jr.	:	

DECLARATION OF X. DANIEL FANG

Pittsburgh, Pennsylvania 15222-2312  
August 18, 2008

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, X. Daniel Fang, declare as follows:

1. I am a citizen of Australia, a permanent resident of USA, and currently reside at 8109 Shady Place, Brentwood, Tennessee 37027.
2. I am over the age of eighteen and am competent to make the statements in this Declaration.
3. My educational background is as follows:  
B.Sc. in manufacturing and design, 1983, Tsinghua University, Beijing, PRC;  
M. Sc. in mechanical engineering, 1986, Tsinghua University, Beijing, PRC;  
Ph.D., in mechanical engineering, 1991, University of Wollongong, Australia;  
Postdoctoral work in mechanical engineering, 1991-1992, University of Kentucky.

4. My employment history includes the following:

Lecturer, Dept. of Mechanical Engineering, 1992-1995, University of Wollongong, Australia;

Assistant Professor/Associate Professor, 1995-1998, Dept. of Mechanical Engineering, Iowa State University;

Senior Engineer/Project Manager in Cutting Tool Geometry Design, 1998-present, ATI Stellram, LaVergne, Tennessee.

5. Through my education and my employment I have gained substantial experience and familiarity with techniques used for manufacturing cutting tool inserts and other cutting tool components. I have gained particular knowledge of and experience with machining techniques and other techniques used to form cutting insert pockets and other features on cutting tool holders. In addition, during the period of my education and employment, I have authored or co-authored about 30 published technical articles related to cutting tools and cutting tool machining technologies.

6. I am named as an inventor on the above-identified U.S. patent application.

7. I have thoroughly reviewed U.S. Patent No. 6,234,724 issued to Satran ("Satran '724") and have carefully considered the cutting tool holders described and depicted in that patent. In particular, I have carefully considered the cutting tool holder and the cutting insert pocket (numbered 52) depicted in Figures 3, 4, and 5 of Satran '724. I note that in Satran '724, Figure 4 is an enlarged perspective view of a cutting insert pocket (52) of the milling cutter shown in Figure 3. I further note that Figure 5 is a horizontal sectional view of the insert pocket (52) shown in Figure 4, taken generally parallel to the bottom surface (54) of the insert pocket (52), with a cutting insert shown abutting the insert pocket (52).

8. I conclude that the cutting insert pocket (52) depicted in Figure 4 of Satran could not be fully formed by tangential milling, whether using, for example, an end milling tool with a ballnose or an end milling tool having a straight edge without a nose. I reach this conclusion because the insert pocket (52) includes several curved and

recessed surfaces that could not have been formed by tangential milling. Examples of these curved and recessed surfaces include the un-numbered curved and recessed lateral surfaces of the relief hollows (74) and (76), and the un-numbered curved and recessed lateral surface between the lateral hollow relief (76) and lateral surfaces (60, 70). Each of these un-numbered curved and recessed lateral surfaces extends in a direction that is not substantially parallel (tangent) to the bottom surface (54) of the insert pocket (52). Instead, these particular un-numbered curved and recessed surfaces of the insert pocket (52) extend in a direction that is normal to the bottom surface (54) of the insert pocket (52). The un-numbered curved and recessed lateral surfaces of insert pocket (52) depicted in Figure 4 would have to be shaped using an axial milling technique, wherein a milling tool advances into the workpiece along an axis that is generally perpendicular to the bottom surface (54) of the insert pocket (52). Axial milling fundamentally differs from tangential milling, wherein the milling tool advances into the workpiece and machines the insert pocket in a direction that is substantially parallel to a bottom surface of the insert pocket.

9. My conclusions in above paragraph 8 are confirmed by Figure 5 of Satran '724, which clearly shows the contour of a section through the two lateral relief hollows (74) and (76) taken substantially parallel to bottom surface (54). The hollows (74) and (76) each comprise several curved surfaces that are perpendicular to the bottom face (54) and are recessed into the walls (56, 58) and (60). Also, an additional small curved surface is shown in Figure 5 recessed into wall (60), adjacent to the curved and recessed surface of lateral relief hollow (76). These recessed surfaces of the cutting insert pocket (52) have shapes that could not have been formed by machining the tool holder 50 using tangential milling.

I further conclude that the cutting insert pockets depicted in Figures 10 -13, 15 and 16 of Satran'724 similarly could not have been formed by tangential milling.

10. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any registration resulting therefrom.

Date: Aug. 18, 2008

  
X. Daniel Fang